

Name: _____ Due: **Nov 9 in lecture**

Single Replacement Reactions Involving the Halogens

Group VIIA Halogens	
9	F Fluorine 18.9984032
17	Cl Chlorine 35.4527
35	Br Bromine 79.904
53	I Iodine 126.90447
85	At Astatine (210)

Oxidation and Reduction:

1. Write the reduction reaction of fluorine, F_2 , gas.
2. Write the oxidation reaction of chloride ion, Cl^- .
3. Write the reduction reaction of liquid bromine, Br_2 .
4. Write the oxidation reaction of iodide ion, I^- .

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General form of a Single Replacement Reaction:



5. List the four halogens in the order of most reactive to the least reactive.

_____ / _____ / _____ / _____
(most reactive) (least reactive)

6. Explain, in your own words, the condition that must be satisfied for a single-replacement reaction involving the halogens to proceed.

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General form of a Single Replacement Reaction:



7. What happens when liquid bromine and an aqueous solution of sodium iodide are mixed together?

(i) Will this reaction occur?

yes no

(ii) If (i) is yes, classify the reaction.

(iii) If (i) is yes, write the product(s) of the reaction. Include the physical states of the product(s).

(iv) If (i) is yes, write the net ionic reaction. Include the physical states of the reactants and products.

(v) If (i) is yes, identify the spectator ion(s).

(vi) If (i) is yes, which species is oxidized.

(vii) If (i) is yes, which species is reduced.

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General form of a Single Replacement Reaction:



8. What happens when iodine in water and an aqueous solution of sodium chloride are mixed together?

(i) Will this reaction occur?

yes no

(ii) If (i) is yes, classify the reaction.

(iii) If (i) is yes, write the product(s) of the reaction. Include the physical states of the product(s).

(iv) If (i) is yes, write the net ionic reaction. Include the physical states of the reactants and products.

(v) If (i) is yes, identify the spectator ion(s).

(vi) If (i) is yes, which species is oxidized.

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General form of a Single Replacement Reaction:



9. What happens when chlorine gas and an aqueous solution of sodium bromide are mixed together?

(i) Will this reaction occur?

yes no

(ii) If (i) is yes, classify the reaction.

(iii) If (i) is yes, write the product(s) of the reaction. Include the physical states of the product(s).

(iv) If (i) is yes, write the net ionic reaction. Include the physical states of the reactants and products.

(v) If (i) is yes, identify the spectator ion(s).

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General form of a Single Replacement Reaction:



10. What happens when fluorine gas and an aqueous solution of lithium chloride are mixed together?

(i) Will this reaction occur?

yes no

(ii) If (i) is yes, classify the reaction.

(iii) If (i) is yes, write the product(s) of the reaction. Include the physical states of the product(s).

(iv) If (i) is yes, write the net ionic reaction. Include the physical states of the reactants and products.

(v) If (i) is yes, identify the spectator ion(s).

(vi) If (i) is yes, which species is oxidized.

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